MEASUREMENT TECHNOLOGIES

SECOND QUARTER QUALITY ASSURANCE REPORT
FOR
TRUE GEOTHERMAL ENERGY COMPANY MONITORING PROGRAM
KILAUEA MIDDLE EAST RIFT ZONE, ISLAND OF HAWAII

Submitted to:

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True Geothermal Energy Company

Prepared by:

MEASUREMENT TECHNOLOGIES

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CN-137

EXECUTIVE SUMMARY

An executive summary of the air quality audit results are as follows:

- The aerometric analyzer audit results were satisfactory. The sulfur dioxide (SO_2) and hydrogen sulfide (H_2S) analyzers meet the slope and intercept criteria.

- The meteorological equipment audit results were satisfactory except the rain gauge had an average volume per tip of 7.52cc instead of 8cc. The gauge was adjusted and reaudited with satisfactory results of 7.98cc per tip.

- The particulate sampler audit results were satisfactory.

- All operational procedures followed at the monitoring sites were consistent with EPA guidelines, and all instrument/analyzer calibrations were done in a proper manner. All documentation was found to be complete, concise, and up to date.

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1.0 Introduction

True Geothermal Energy (True) contracted Measurement Technologies to assemble and operate two ambient air/meteorological monitoring stations for the True/Mid-Pacific Development Project (True/Mid). The monitoring program will be used to support the incremental exploration and development of the Kilauea Middle East Rift Zone Geothermal Resources Subzone (GRS), Puna District Island of Hawaii.

As part of the monitoring program, Measurement will provide four quality assurance audits (one each monitoring quarter) for each monitoring station operational year. The quality assurance audits will consist of verifying the accuracy of each measured air quality/meteorological parameter collected by separate standards from operations standards or by side-by-side comparisons with calibrated collocated sensors.

This document represents the results and methodology used to conduct the second quarterly quality assurance audit which was performed by Mr. Jim Nedry on April 14 and 15, 1990. In addition to this introduction, Section 2.0 presents a description of the monitoring network. A description of the field audit procedures is contained in Section 3.0. Section 4.0 documents the certification and validation of the equipment and standards used for the audit. Section 5.0 presents the results of the audit. Appendix A contains copies of the audit data sheets. Station inspection checklists are presented in Appendix B.

Present for the audit was the field operator, Mr. Steve Avery.

2.0 Monitoring Network Description

The monitoring network consists of two monitoring stations located approximately 7 miles west of Pahoa, Hawaii. The primary monitoring site is designated as "Site 1 Air Quality/Met". This site is located in the Kaohe Homesteads near the end of Kaohe Homesteads Road in a large 5 acre residential home lot. The second monitoring site is designated as the meteorological site "Site 2 MET". This site is located at the Drill site 1. The monitoring stations and site monitoring parameters are identified in Table 2-1.

Table 2-1. Monitored Parameters

PARAMETER	SITE 1	SITE 2
SULFUR DIOXIDE (SO2)	X	
HYDROGEN SULFIDE (H2S)	X	8 PLS
WIND DIRECTION	X	X
WIND SPEED	X	X
VERTICAL WIND SPEED		X
SIGMA THETA	X	X
SIGMA W		X
TEMPERATURE	X	
PRECIPITATION	X	
RAIN WATER (ANIONS & DISSOLVED METALS)	3 PLS	
METALS (ATMOSPHERIC PARTICULATE)	X	
TOTAL SUSPENDED PARTICULATES (TSP)	X	
INHALEABLE PARTICULATES (PM-10)	X	
RADON		X

2.1 Site 1 Air Quality

The monitoring station is located in a large open field approximately 400 by 600 feet behind a residence. A portable shelter houses the aerometric analyzers and data acquisition equipment. The meteorological equipment is mounted on a 10 meter retractable tower attached to the side of the shelter. A stainless steel intake manifold extends out of the roof 1 meter. The integrated sampler and particulate samplers (PM-10 and TSP) are located on a wooden platform about 30 feet to the west of the monitoring shelter. The inlet to the particulate sampler is 1 meter in height. The inlet to the integrated sampler is 1.5 meters in height. The air quality station obtains electrical power from one of two propane generators housed in a small building about 200 feet to the west of the monitoring station.

The three plastic rain gages for collection of rainwater samples are located in the Kaohe Homestead area on residential properties along Kaohe Homesteads Road. The first rain gage is located next to the particulate platform at the monitoring station site. The second gage is located on a open residential lot about 1,200 feet northeast of the monitoring station site. The third rain gage is located on the property of a large commercial horticulture farm about 1,200 feet farther to the northeast of the second rain gage site. The tipping bucket rain gage for continuous collection of real time rain data is located atop the monitoring station roof.

Sulfur dioxide and hydrogen sulfide is measured using Meloy Laboratories flame ionization analyzers. Wind speed and wind direction are monitored with the Met One model 014 three-cup anemometer and the Met One model 024 light weight air foil wind direction sensor. Temperature is measured with a Met One model 060 temperature sensor mounted in a Met One naturally aspirated radiation shield. Precipitation is measured with a Weathertronics 6010 tipping bucket type rain gage.

The data acquisition is performed by an Odessa Engineering DSM 3260 air quality/meteorological data acquisition system (DSM). The DSM retrieves, processes and then stores the collected data on removeable solid state data cartridges. In addition to the storage of data on the data cartridges, the data is backed up by a printed hardcopy using a Star NX1000 dot matrix printer. The data stored on the cartridges is retrieved by removing the cartridges and sending them to Measurement Technologies home office in San Luis Obispo, California where the data is then stored and processed on an IBM-AT compatible computer system equipped with a data management software package.

The air quality station is equipped with a Radian RAD III gas dilution calibrator which provides the precise gas concentrations to perform daily Level 2 checks, multipoint calibrations, Level 1 and precision checks on the sulfur dioxide and hydrogen sulfide analyzers.

2.2 Site 2 MET

The meteorological site is located at the Drill site D-1. Meteorological sensors are located atop a 10 meter retractable tower located at the edge of the large water storage pond. A NEMA 4 enclosure is mounted at the base of the tower to house the Odessa DSM 3260/MET system, charger and battery. A solar panel is mounted on the tower to supply power for the DSM, meteorological sensors and charge the battery.

Eight passive hydrogen sulfide dosimeter badges are placed on fence posts located along the perimeter of the drill site. These badges are located to the N, NE, E, SE, S, SW, W and NW around the drill area. A Radon detector is located to the south of the drilling platform.

Wind speed and wind direction are monitored with a Weathermeasure W203 three-cup anemometer and a Weathermeasure

W204 air foil wind direction sensor. Vertical wind speed is monitored with a R. M. Young Gill propeller anemometer.

The data acquisition is handled by an Odessa Engineering DSM 3260 meteorological data acquisition system (DSM). The DSM retrieves, processes and then stores the data on removeable solid state data cartridges. The data stored on the cartridges is retrieved by removing the cartridges and sending them to Measurement Technologies home office in San Luis Obispo, California where the data is then stored and processed on an IBM-AT compatible computer system equipped with a data management software package.

3.0. Performance Audit Procedures and Equipment Description

3.1. Audit Procedures

3.1.1. Sulfur Dioxide, Hydrogen Sulfide

The sulfur dioxide and hydrogen sulfide analyzers were audited by producing four upscale gas concentrations plus zero by diluting National Bureau of Standards (NBS) traceable standard gases with zero air. A capillary and gauge flow controlled dynamic dilution audit calibrator was used to mix the zero air and audit gases.

Audit concentrations were introduced into each analyzer upstream of the sample filters and lines (through as much of the sample train as possible). Each analyzer was allowed to sample the audit concentration until a stable response could be obtained. The analyzer response was determined by taking the average of at least five consecutive readings from the data acquisition system over a period of several minutes. The gas ranges and concentrations used to conduct the audits are presented in Table 3-1.

Table 3-1. Audit Gas Concentrations

Range ppb	SO_2 ppb	H_2S ppb
0	0	0
30 - 80	66	73
150 - 200	181	188
250 - 350	310	322
350 - 450	403	418

3.1.2 Wind Direction

A portable field compass was used to determine the orientation of the wind sensor crossarm. A correction of + 11° was made for the magnetic declination. The wind direction accuracy was tested by aligning the wind vane parallel to the crossarm (north) and rotating 180 degrees (south). Linearity of the sensor was checked by aligning the wind vane perpendicular to the crossarm (east) and rotating 180 degrees (west).

3.1.3 Wind Speed

The wind speed sensor at the Air Quality site (Site 1) was tested by connecting 300 and 600 revolution per minute (RPM) continuous speed synchronous motors to the sensor shaft. The manufacturer's algorithm was used to convert RPM's to miles per hour (MPH) and the result was compared to the DSM output.

The wind speed sensors at the Met station located at the drill site (Site 2) was tested by connecting a battery powered motor to the sensor shafts. The RPM of the motor was determined and converted to MPH and the results were compared to the DSM output.

3.1.4 Temperature

The temperature sensor was checked by collocation with an NBS-traceable thermometer. The thermometer was housed in an aspirated Assmann Psychrometer. The thermometer reading was compared to the temperature output on the DSM.

3.1.5 Precipitation

The precipitation gauge was audited by adding a known volume (32 cc) of water. The gauge inlet is 8" in diameter and one tip represents 0.01" of precipitation. According to the manufacturer's specifications, if 32 cc of water is slowly added

to the gauge, the bucket should tip 4 times. This should result in the DSM output of 0.04" of precipitation.

3.1.6 Particulate Sampler

The samplers were audited using the procedures described in The Quality Assurance Handbook for Air Pollution Measurement Systems, Section 2.2.8.1 (January, 1983), and Section 2.0.12.11 (June, 1984). The procedure consists of placing an audit orifice on each sampler inlet with the sampling filter in place. The sampler is then turned on and allowed to warm up for about five minutes. After warm up, the following data are recorded:

- Orifice pressure drop in inches of water;
- Ambient temperature and barometric pressure;
- Indicated station sampler flow as read by the sampler chart recorder.

The audit flow is then calculated using the orifice calibration. The TSP and PM-10 sampler flows are calculated to standard conditions and the values are compared to their respective station flow in percent difference.

3.1.7 Integrated Sampler

The integrated sampler is audited by measuring the flows with a Hastings HBM-1 bubble flowmeter. The flows are then compared with the station calibration curve for the sampler and the results are presented in percent difference.

3.1.8 Station Evaluation

A site checklist was completed as part of the systems audit at each monitoring station. Copies of the checklists are presented in the Appendix B.

3.2 Audit Equipment Description

3.2.1 Audit Calibrator

The audit calibrator used to conduct the audits of the air quality analyzers was a Measurement Technologies Model 2000A mass flow controlled dynamic gas dilution calibrator. The calibrator contains a 10,000 sccm dilution mass flow controller and a 50 sccm source gas mass flow controller. The gas calibrator produces precise audit concentrations by diluting high level gas standards with dilution air. Dilution and zero air is produced by an internal clean air system to remove all concerned compounds from the dilution and zero air. The clean air system consists of a permeation dryer to dry the air, an ultraviolet source to irradiate the dry air to convert any nitric oxide (NO) present to nitrogen dioxide (NO2). After the air is irradiated it is passed through packed activated charcoal and Purafil columns to remove any ozone, sulfur dioxide, hydrogen sulfide, nitric oxide and ammonia present in the air. Digital display is provided for visual verification of flow.

Audit calibrator flow rates were measured prior to the audit using an NBS traceable Hastings bubble flowmeter. The auditor used a bubblemeter to verify flows if there was any indication that an audit flow was incorrect.

3.2.2 Wind Speed Motors

Two Met One Inc. continuous speed synchronous motors were used to audit the wind speed sensors at Site 1. One motor operates at 300 RPM and the other at 600 RPM. These motors are tested once a year for accuracy. Site 2's wind speed sensor was audited by connecting a battery powered motor to the sensor shaft. The RPM of the motor was verified and converted to MPH. The results were compared to the DSM output.

3.2.3 Miscellaneous Audit Equipment

A NBS traceable thermometer was used for auditing the temperature. The barometer used in the particulate sampler audits was verified by comparison with a National Weather Service (NWS) barometer before the audit. A transit was used for determining the orientation of the wind direction crossarm. A General Metals Works orifice kit was used to perform flow rate audits of the particulate samplers.

4.0 Audit Standards Verification

Where applicable each audit standard was verified or certified using the appropriate methods specified in the applicable EPA guidelines.

4.1 Gas Standards

Two gas standards were used during this audit. The cylinder containing sulfur dioxide (SO_2) was certified to be accurate within 2 percent using EPA Protocol NO. 2 by the manufacturer (Scott-Marrin, Inc). Protocol No. 2 requires a direct comparison between the audit gas and National Bureau of Standards (NBS) Standard Reference Material (SRM). This traceability protocol is contained in EPA-600/4-77-027a, Quality Assurance Handbook for Air Pollution Measurement Systems, Vol II, Section 2.0.7.

The cylinder containing hydrogen sulfide (H_2S) was blended and verified to be accurate within 2 percent of NBS Standard Reference Material (SRM). There is currently no EPA protocol for hydrogen sulfide gas.

4.2 Audit Calibrator

The audit calibrator was a Measurement Technologies model 2000A mass flow controlled dynamic gas dilution calibrator. The calibrator was previously described in Section 3.2.1. Audit flow rates were measured prior to the audit using an NBS traceable Hastings bubble flowmeter.

4.3 Particulate Sampler Audit Equipment

A General Metal Works orifice was used for auditing the PM-10 and TSP samplers. The orifice is checked annually against an NBS traceable roots meter. The integrated sampler was audited with an NBS traceable Hastings HB1 bubble meter.

4.4 Meteorological Audit Equipment

A NBS traceable thermometer was used for auditing the temperature. Synchronous motors used for auditing windspeed sensors are tested for accuracy on an annual

5.0 Audit Criteria and Results

5.1 Audit Criteria Ambient Air Quality Analyzers

The EPA recommended audit criteria for aerometric analyzers used in the measurement of criteria pollutants is presented in Table 5-1. These criteria are taken from EPA-600/4-77-027a, Quality Assurance Handbook for Air Pollution Measurement Systems, Vol. II, May, 1977.

Table 5-1. Analyzer Audit Accuracy Specifications

Slope	
Excellent	≤ ±5% between analyzer response and audit concentration
Satisfactory	±6% to ±15% between analyzer response and audit concentration
Unsatisfactory	> ±15% between analyzer response and audit concentration
Intercept	
Satisfactory	≤ ±3% of the analyzer range
Unsatisfactory	≥ ±3% of the analyzer range
Correlation Coefficient	
Satisfactory	0.9950 to 1.000
Unsatisfactory	< 0.9950

5.2 Audit Criteria Meteorological Instruments

The EPA recommended audit criteria for meteorological instruments is presented in Table 5-2. These criteria are taken from EPA-600/4-82-060, Quality Assurance Handbook for Air

Pollution Measurement Systems, Vol. IV, Meteorological Measurements, February, 1983.

Table 5-2. Meteorological Audit Accuracy Specifications

Parameter	Tolerance
Wind speed[1]	±0.2m/s (< 5m/s) ±5% (> 5m/s)
Wind direction[2]	±2°
Temperature	±0.25°C
Precipitation	±0.01"

1 This criteria was adjusted to be consistent with the accuracy specifications for wind speed sensors in EPA-450/4-007, Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD), May 1987.

2 This criteria is an accuracy criteria which only applies to the accuracy of the audit point where the sensor is aligned with the crossarm. The linearity criteria used by Measurement Technologies is ± 3° which conforms with the accuracy specification for wind direction sensors in the PSD guidelines.

5.3 Audit Criteria Particulate & Integrated Sampler

The EPA recommended audit criteria for particulate and integrated samplers is ± 7 % difference between the audit flow and actual flow rate.

5.4 Audit Results

Completed audit data sheets for each audit parameter are presented in Appendix A. All aerometric analyzers and meteorological equipment demonstrated satisfactory results, with

the exception of the precipitation gauge (refer to Section 5.4.2). Completed station inspection checklists are presented in Appendix B.

5.4.1 Ambient Air Quality Analyzers

The SO_2 and the H_2S analyzers demonstrated satisfactory results to the audit tests.

5.4.2 Meteorological Equipment Audit Results

The average volume per tip for 10 tips of the rain gauge measured 7.52cc instead of 8cc. The gauge was adjusted by the site operator and reaudited with satisfactory results.

5.4.3 Particulate & Integrated Samplers Audit Results

The particulate and integrated samplers demonstrated satisfactory results to the audit test.

APPENDIX A

H_2S AUDIT

DATE: April 14, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: Jim Nedry

ANALYZER MFR: Meloy Labs CALIBRATOR MFR: Meas. Tech.

MODEL NUMBER: SA285E MODEL NUMBER: 2000A

ANALYZER S/N: 7E033 CALIBRATOR S/N:

AUDIT GAS CYL. NO: JJ22413 AUDIT GAS CONC: 50.7 ppm

H_2S AUDIT DATA

Gas Setting/ Flow cc/min	Dilution Setting/ Flow cc/min	H_2S Input (ppb)	H_2S Output (ppb)	Percent Difference
25/24.7	3.0/2970	418	406	-2.9
25/24.7	4.0/3868	322	316	-1.9
25/24.7	7.0/6653	188	177	-5.9
10/9.6	7.0/6653	73	70	-4.1
-	-	0	8	-
Slope: 0.9627		Y-Intercept: 3	Corr.Coef: 0.9996	

Dilution Chamber Flow = 182.6 cc/min

418 ppb SO2 injected through scrubber. Analyzer response = 2 ppb

SO_2 AUDIT

DATE: April 14, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: Jim Nedry

ANALYZER MFR: Meloy Labs CALIBRATOR MFR: Meas. Tech.

MODEL NUMBER: SA285E MODEL NUMBER: 2000a

ANALYZER S/N: 7E034 CALIBRATOR S/N:

AUDIT GAS CYL. NO: JJ8945 AUDIT GAS CONC: 48.8 ppm

SO_2 AUDIT DATA

Gas Setting/ Flow cc/min	Dilution Setting/ Flow cc/min	SO_2 Input (ppb)	SO_2 Output (ppb)	Percent Difference
25/24.7	3.0/2970	403	363	-9.9
25/24.7	4.0/3868	310	285	-8.1
25/24.7	7.0/6653	181	166	-8.3
10/9.6	7.0/6653	70	66	-5.7
-	3.0/2970	0	-4	-
Slope: 0.9103	Y-Intercept: 0		Corr.Coef: 0.9998	

Dilution Chamber Flow = 182.6 cc/min

WIND DIRECTION AUDIT

DATE: April 14, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: Jim Nedry

PARAMETER: Wind Direction SENSOR MFR: Met One

MODEL NUMBER: 024 S/N: G1260

WIND DIRECTION AUDIT DATA

Audit Point	DAS Output	Difference
01°	01°	0°
91°	89°	-2°
181°	181°	0°
271°	272°	1°

NOTE: Crossarm Orientation = 1°
Data corrected for 11° WMD

WIND SPEED AUDIT

DATE: April 14, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: Jim Nedry

PARAMETER: Wind Speed SENSOR MFR: Met One

MODEL NUMBER: 014 S/N: G1255

WIND SPEED AUDIT DATA

Audit Point	DAS Output	Difference
18.9 mph	18.9 mph	0.0 mph
36.8 mph	36.8 mph	0.0 mph

TEMPERATURE AUDIT

DATE: April 14, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: Jim Nedry

PARAMETER: Temperature SENSOR MFR: Met One

MODEL NUMBER: 060 S/N: None

TEMPERATURE AUDIT DATA

Audit Point	DAS Output	Difference
71.2°F	71.0°F	-0.2°F

PRECIPITATION AUDIT

DATE: April 14, 1990 PROJECT: True Geothermal

SITE: Air Quality, Site 1 AUDITOR: Jim Nedry

PARAMETER: Precipitation SENSOR MFR: Weathertronics

MODEL NUMBER: 6010 S/N: None

PRECIPITATION AUDIT DATA

Audit Point	DAS Output	Difference
10 tips	10 tips	---

The expected volume of water per 10 tips is 80cc.
The volume measured for 10 tips was 75.2cc.
The gauge was adjusted on April 25. A reaudit demonstrated a volume of 79.8cc for 10 tips.

INTEGRATED SAMPLER AUDIT

Project: True Geothermal

Station: Air Quality, Site 1

Date of Audit: 4/15/90

Time of Audit: 13:00

Auditor: Jim Nedry

Sampler MFG: Measurement Tech

Serial No.: None

Temperature: 21.5 °C

Stn. Press: 734mm Hg

INTEGRATED SAMPLER AUDIT DATA

Flowmeter Setting	Time of Run	Flask Size	Audit Flow	Station Flow	Diff. %
0.8	7.9 sec	100 cc	759 cc/min	736	-3.0
1.0	6.2	100	968	957	-1.1
1.2	5.2	100	1154	1205	4.4
1.4	4.3	100	1395	1407	0.9

HI-VOLUME SAMPLERS AUDIT

Project: True Geothermal

Station: Air Quality, Site 1 HI-VOL NO:

Date of Audit: 4/15/90 Audit Kit No.:

Time of Audit: 12:00 Temperature: 21 ^{o}C

Auditor: Jim Nedry Stn. Press: 734mm Hg

HI-VOLUME SAMPLER DATA

Manometer Reading (" H_2O)	Uncorrected Flow Q_i from Orifice Calibration Table ("H_2O vs. Flow)	Calibration Flow * (Q_i x FCF) SCFM	Chart Reading SCFM	Diff. %
7.4	46.4	45.9	48	-1.1

* Flow referenced to calibration conditions

Flow Correction Factor (FCF) = $\frac{(T_2 + 273) \times P_1}{(T_1 + 273) \times P_2}$

where: Audit Temperature T_1 = 25 ^{o}C
Audit Pressure P_1 = 760 mmHg
T_2 and P_2 are the ambient temperature and barometric pressure during the hi-vol audit.

PM-10 SAMPLERS AUDIT

Project: True Geothermal

Station: Air Quality, Site 1 HIVOL NO:

Date of Audit: 4/15/90 Audit Kit No.: One

Time of Audit: 12:00 Temperature: 21 ^{o}C

Auditor: Jim Nedry Stn. Press: 734 mm Hg

PM-10 SAMPLER DATA

Manometer Reading (" H_2O)	Uncorrected Flow Q_i from Orifice Calibration Table ("H_2O vs. Flow)	Calibration Flow * (Q_i x FCF) SCFM	Chart Reading SCFM	Diff. %
6.6	43.8	44.2	40	0.9

* Flow referenced to calibration conditions

Flow Correction Factor (FCF) = $\frac{(T_2 + 273) \times P_1}{(T_1 + 273) \times P_2}$

where: Audit Temperature T_1 = 25 ^{o}C
Audit Pressure P_1 = 760 mmHg
T_2 and P_2 are the ambient temperature and barometric pressure during the hi-vol audit.

WIND DIRECTION AUDIT

DATE: April 15, 1990 PROJECT: True Geothermal

SITE: MET, Site 2 AUDITOR: Jim Nedry

PARAMETER: Wind Direction SENSOR MFR: Weather Measure

MODEL NUMBER: W204 S/N: 2066

WIND DIRECTION AUDIT DATA

Audit Point	DAS Output	Difference
01°	01°	0°
91°	90°	-1°
181°	179°	-2°
271°	269°	-2°

NOTE: Crossarm Orientation = 1°
Data corrected for 11° WMD

WIND SPEED AUDIT

DATE: April 15, 1990 PROJECT: True Geothermal

SITE: MET, Site 2 AUDITOR: Jim Nedry

PARAMETER: Wind Speed SENSOR MFR: Weather Measure

MODEL NUMBER: W203 S/N: 1256

WIND SPEED AUDIT DATA

Audit Point	DAS Output	Difference
0 mph	0 mph	0.0 mph
16.3 mph	17.0 mph	4.3 %
32.6 mph	33.5 mph	2.8 %

VERTICAL WIND SPEED AUDIT

DATE: April 15, 1990 PROJECT: True Geothermal

SITE: MET, Site 2 AUDITOR: Jim Nedry

PARAMETER: Vertical Wind Speed SENSOR MFR: R. M. Young

MODEL NUMBER: S/N:

WIND SPEED AUDIT DATA

Audit Point	DAS Output	Difference
0.0 mph	0.0 mph	0.0 mph
3.3 mph	3.4 mph	0.1 mph
-3.3 mph	-3.2 mph	0.1 mph
6.6 mph	6.6 mph	0.0 mph
-6.6 mph	-6.5 mph	0.1 mph

APPENDIX B

STATION INSPECTION CHECKLIST

PROJECT: True Geothermal

SITE: Air Quality, Site 1 DATE: 4/14/90

	YES	NO
1. Is the shelter secured when unattended?	Y	
2. Is the equipment power supply regulated?	Y	
3. Is heating and air conditioning adequate?	Y	
4. Is the station kept between 22°C and 25°C?	Y	
5. Is the station clean and orderly?	Y	
6. Are all gas cylinders properly secured?	Y	
7. Is the sample intake system glass or teflon? constructed of stainless steel		N
8. Is the sample intake system clean?	Y	
9. Does the sample intake system meet all siting criteria?	Y	
10. Is the station adequately lighted?	Y	
11. Is there an up to date and legible station log?	Y	
12. Is there a stripchart or hardcopy backup to the data acquisition system?	Y	
13. Does the station have a complete set of instrument manuals?	Y	
14. Does the site operator complete a site checklist at each visit?	Y	
15. Is the site visited at least every 3 days?	Y	

COMMENTS: Intake manifold is stainless steel

STATION INSPECTION CHECKLIST

PROJECT: True Geothermal

SITE: Met, Site 2 DATE: 4/15/90

	YES	NO
1. Is the shelter secured when unattended?	Y	
2. Is the equipment power supply regulated?	Y	
3. Is heating and air conditioning adequate?	NA	
4. Is the station kept between 22°C and 25°C?	NA	
5. Is the station clean and orderly?	Y	
6. Are all gas cylinders properly secured?	NA	
7. Is the sample intake system glass or teflon?	NA	
8. Is the sample intake system clean?	NA	
9. Does the sample intake system meet all siting criteria?	NA	
10. Is the station adequately lighted?	NA	
11. Is there an up to date and legible station log?	Y	
12. Is there a stripchart or hardcopy backup to the data acquisition system?		N
13. Does the station have a complete set of instrument manuals?		N
14. Does the site operator complete a site checklist at each visit?	Y	
15. Is the site visited at least every 3 days?	Y	

COMMENTS: The MET site is a remote solar/battery powered station. Manuals for the equipment are kept at the air quality station (Site 1).

MEASUREMENT TECHNOLOGIES

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